

CLAIMS

What is being claimed is:

1. A structure comprising:
a semiconductor light emitting device; and
a substrate comprising a ceramic core and at least one copper layer overlying the core, the at least one copper layer having a thickness of at least 4 mils;
wherein the semiconductor light emitting device is electrically connected to at least one of the copper layers.
2. The structure of claim 1 wherein the semiconductor light emitting device comprises a III-nitride light emitting layer.
3. The structure of claim 1 wherein the core comprises a material selected from the group of ceramic, Al_2O_3 , AlN , alumina, and silicon nitride.
4. The structure of claim 1 further comprising at least one lead connected to at least one of the copper layers.
5. The structure of claim 1 further comprising at least one solder pad connected to at least one of the copper layers.
6. The structure of claim 1 further comprising at least one terminated wire connected to at least one of the copper layers.
7. The structure of claim 1 wherein the at least one copper layer is bonded to the core by a direct copper bond.
8. The structure of claim 1 wherein the at least one copper layer is bonded to the core by an active metal braze.
9. The structure of claim 1 wherein the at least one copper layer has a thickness between about 4 mils and about 24 mils.
10. The structure of claim 1 wherein the substrate is a first substrate, the structure further comprising a second substrate disposed between the semiconductor light emitting device and the first substrate.
11. The structure of claim 10 wherein the second substrate comprises at least one metal bonding pad and an insulating layer.

12. The structure of claim 11 wherein the insulating layer comprises AlN.
13. The structure of claim 10 wherein the second substrate comprises a silicon integrated circuit.
14. The structure of claim 1 further comprising a base connected to the substrate.
15. The structure of claim 1 further comprising a lens disposed over the semiconductor light emitting device.
16. The structure of claim 1 wherein the copper layer is bonded to the core.
17. The structure of claim 1 wherein the copper layer is bonded to the core by a process comprising:
 - forming an oxide coating on a sheet of copper;
 - placing the oxide coating adjacent to the core; and
 - heating the oxide coating to form a eutectic melt.
18. A method of packaging a semiconductor light emitting device, the method comprising:
 - providing a substrate having a ceramic core and at least one copper layer, the at least one copper layer having a thickness of at least 4 mils; and
 - electrically connecting a semiconductor light emitting device to at least one of the copper layers.
19. The method of claim 18 further comprising attaching at least one lead to the at least one copper layer.
20. The method of claim 18 wherein the substrate is a first substrate, the method further comprising:
 - mounting the semiconductor light emitting device on a second substrate; and
 - after mounting the semiconductor light emitting device on the second substrate, mounting the second substrate on the first substrate.
21. The method of claim 18 further comprising:
 - providing a lens over the semiconductor light emitting device.
22. The method of claim 18 further comprising bonding the copper layer to the core by:
 - forming an oxide coating on a sheet of copper;
 - placing the oxide coating adjacent to the core; and
 - heating the oxide coating to form a eutectic melt.